

## I SCHAUDER BASES

- 1.1 Haar orthonormal system
- 1.2 Schauder basis of  $C\langle 0,1 \rangle$
- 1.3 Orthonormal set on  $\langle 0,\infty \rangle$
- 1.4 Schauder basis on  $\langle 0,\infty \rangle$
- 1.5 Application

## II THE BROWNIAN MOTION PROCESS AND WIENER MEASURES

- 2.1 Preliminaries
- 2.2 Construction of the process
- 2.3 Brownian motion process
- 2.4 Markov property
- 2.5 Wiener measures

## III THE STRONG MARKOV PROPERTY

- 3.2 The transition function and its associated semi-group of operators
- 3.2 An extension lemma and measurability
- 3.3 Extension of the Markov property
- 3.4 The Markov times
- 3.5 The strong Markov property

## IV FIRST EXIT AND ENTRANCE TIMES

- 4.1 Choquet capacity
- 4.2 Preliminaries
- 4.3 First entrance and exit times
- 4.4 Hitting times and probabilities
- 4.5 Regular points

V EXCESSIVE AND SUPERHARMONIC FUNCTIONS  
REGULAR POINTS AND THIN SETS

- 5.1 More about Markov property
- 5.2 A sufficient condition for regularity and the Lebesgue measure of the set of irregular points
- 5.3 Transition functions and transition densities
- 5.4 Potential-theoretic background
- 5.5 Excessive and superharmonic functions
- 5.6 Regularity and thinness

- VI GREEN FUNCTIONS AND POTENTIALS
  - 6.1 Fundamental solution of the heat equation
  - 6.2 Principle of not feeling the boundary
  - 6.3 Green functions for the Laplace operator and Greenian domains
  - 6.4 Potentials
  - 6.5 Newtonian capacity
  
- VII DIRICHLET PROBLEM. BALAYAGE. ENERGY
  - 7.1 Dirichlet problem
  - 7.2 Dynkin's Lemma and its application
  - 7.3 Balayage
  - 7.4 Energy
  - 7.5 Energy and balayage
  
- VIII SEMI-CLASSICAL APPROACH TO POTENTIAL THEORY
  - 8.1 Strong balayage
  - 8.2 Strongly thin sets
  - 8.3 Necessary condition for  $s$ -thinness
  - 8.4  $S$ -regular sets
  - 8.5 Semi-classical sets
  
- IX THE KAC CAPACITORY POTENTIALS
  - 9.1 Analytic background
  - 9.2 Measurability of sojourn times
  - 9.3 Probability of spending a positive time in a given set
  - 9.4 The Kac capacity potentials
  - 9.5 Analytic formulas of Mark Kac
  
- X BALAYAGE AND DIRICHLET PROBLEM IN THE KAC POTENTIAL THEORY. APPLICATIONS
  - 10.1 Probability interpretation of  $s$ -thinness
  - 10.2 First occupation time and strong balayage
  - 10.3 Analytic results connected with strong balayage and Dirichlet problem
  - 10.4 Balayage, energy and quasi  $s$ -regular sets
  - 10.5 Applications